1998 OREGON PLAN FISH SUMMARY

INTRODUCTION

Understanding where coho and steelhead occur and how they fit into the larger aquatic vertebrate community is an important component of the Oregon Plan. In much of the Coastrange, baseline information on aquatic vertebrate communities does not exist. Over time, continued monitoring efforts will enable us to track changes in composition and abundance of species within these communities and link them to land use issues and restoration efforts. It will also assist in making the appropriate management decisions for different situations.

During the summer of 1998 DEQ surveyed the aquatic vertebrate communities at 38 sites as part of the Oregon Plan protocol. Our efforts this season were restricted to the North coast as a result of the listing of coho stocks along the South coast and cutthroat listing in the Umpqua drainage. In the future, our coverage should include the entire Coastrange and the Lower Columbia excluding the Umpqua basin. This is dependent upon obtaining the necessary collecting permits from the National Marine Fisheries Service (NMFS) and Oregon Department of Fish and Wildlife. This report summarizes the 1998 Coast Range vertebrate data.

METHODS

Survey sites were randomly selected from a population of wadable sites that encompass the entire the Coastal and Lower Columbia Evolutionarilly Significant Units (ESU's). Fish and amphibians were captured using single pass electofishing along a 40 channel width stream segment (McCormick and Hughes 1997). Stunned fish were netted, placed in a bucket of cold water and allowed to recover. The fish were then identified, tallied, and measured for total length before being returned to the stream. The survey time was adjusted for the reach length to roughly normalize the effort between sites. The effort was distributed according to the relative abundance of habitat types to insure an unbiased sample. Voucher specimens were collected for species that were difficult to identify in the field for verification in the laboratory. Abnormalities and incidental mortality were recorded. Temperature data used for data comparisons were collected using continuous monitoring devices placed within the study reach in a well mixed portion of the channel.

RESULTS

Diversity

We collected 19 unique species of fish and amphibians during 1998 (Figure 1). The diversity ranged from 1 species at Youngs Creek to 8 species at Cummins Creek with the mode being 3 and 4 species across all sites. Seven species were found at only one locality. Cutthroat trout was the most ubiquitous species occurring at 30 unique sites followed by Pacific giant salamander which were present at 19 sites. Coho, cutthroat and rainbows occurred together at 10 of the 38 site visits.

Salmonids (*Salmonidae*)

Coho salmon (*Oncorhynchus kisutch*)- A total of 225 coho, representing 4% of the total catch, were collected at 34% of the site visits (13 out of 38 sites). The average coho catch per site was 17 ± 9 fish. The maximum number of coho collected on one visit was 34 and the minimum was 3. Pooled size class data on coho shows two distinct classes: a group from 2 to 5 centimeters representing 10% of the total catch and a second group in the 6 to 10 centimeter range representing 90% of the total catch (Figure 2).

Cutthroat trout (*Oncorhynchus clarki*)- A total of 1383 cutthroat, representing 28% of the total catch, were collected at 83% (30 out of 38) of the site visits. The average catch for sites with cutthroat was 79 ± 35 fish. The maximum number of cutthroat collected was 127 and the minimum was 2. Pooled size class data shows three size classes: a group from 3 to 8 centimeters, another group from about 9 to 12 centimeters and a third group 13 centimeters and up (Figure 3). The first size class represents 44% of the total cutthroat catch followed by the second group at 36% and the third group at 20%.

Rainbow trout (*Onchorynchus mykiss*)- A total of 1124 rainbow trout, representing 23% of the total catch, were collected at 53% (20 out of 38) of the site visits. The average catch for sites with rainbows was 56 ± 65 fish. The maximum number of rainbows collected was 206 fish at Clear Creek and the minimum was 1 fish at both Haight Creek and Deer Creek. Pooled size class data shows three size classes: a group from 2 to 9 centimeters, another group from about 10 to 14 centimeters and a third group 15 centimeters and up (Figure 4). The 2 –9 centimeter group comprised 65% of the population with the 10-14 and 15centimeter and larger groups making up 33% and 2% respectively.

Sculpins (*Cottidae*)

Sculpins represent the most diverse fish group across our 1998 Oregon Plan sites. We collected 4 of the 5 sculpin species known to occur in the Coastrange and one species associated with the lower Columbia and eastern Cascades (Markle et al. 1996). Reticulate sculpins (*Cottus perplexus*) were the second most abundant vertebrates collected. Cummins Creek had the greatest sculpin diversity at a single site (n=3) with riffle sculpins (*C. gulosus*) and Coastrange sculpins (*C. aleuticus*), only being found there. Eagle Creek along the Lower Columbia was the only site where shorthead sculpins (C. *confusus*) were found.

Other Fish Groups

The remaining fish groups, lampreys (*Petromyzontidae*), suckers (*Catastomatidae*), minnows (*Cyprinidae*) and sticklebacks (*Gasterosteidae*), had only one representative species from each. Pacific lamprey (*Lampetra tridentata*) was collected at 8 sites. Seven of those sites had only the larval form (ammocoete) and one adult was collected at Tenmile Creek. Largescale sucker (*Catostomas macrocheilus*) was collected along the West Fork of the Millicoma and represents the only member of the sucker family that was seen. Speckled dace (*Rhinichthys osculus*), the only minnow, occurred at 7 sites. Three-spined sticklebacks (*Gasterosteus aculeatus*) were found at one location within the Coquille watershed.

Amphibians

Amphibians were the most diverse vertebrates surveyed. In total, 4 frog species and 3 salamander species were found. Three occurred in both larval and adult forms. Separating larval and adult forms in Amphibians is important because they are functionally distinct life stages. Pacific giant salamanders (*Dicamptedon tenebrosus*) were found as juvenile larvae, neotenic larvae (reproductive) and terrestrial adults. Red-legged frogs (*Rana aurora*) and Tailed frogs (*Ascaphus truei*) were found as tadpoles and adults.

Temperature

The effects of habitat and other variables make it difficult to directly measure the effects of temperature. However, the percentage of salmonids decreased with an increase in temperature (Figure 5). The average percentage of salmonids below 17.8 degree Celsius was 56% ± 25%. Above the temperature standard the percentage of salmonids dropped to 34%± 16 %. For species which occurred at four sites or more, Tailed frogs and Pacific giant salamanders were found in the coldest average water temperatures and rainbow trout and speckled dace occurred in the warmest (Figure 6).

DISCUSSION

Single pass electrofishing is only adequate for describing the occurrence and relative adundance of species. In order to draw conclusions about the abundance of species, more intensive catch and removal techniques need to be employed (Neilsen and Johnson 1983). Nevertheless, our data suggests some interesting trends that warrant further investigation.

Coho were by far the smallest proportion of the salmonids captured and a small fraction of the total catch. Data on the coho size classifications suggests that recruitment in 1998 may be down from 1997. When compared with the population structures of cutthroat and rainbow, the coho size classes are markedly skewed towards larger individuals.

Conversely, cutthroat and rainbow trout showed a more typical size class distribution. Small individuals dominated all other size classes, a pattern indicative of a more balanced

population. However, it should be noted that total abundance data for rainbow trout might be misleading. rainbow trout made up a substantial proportion of the total catch but had the widest degree of variability between sites. This may suggest they are doing better in some locations than in others.

As a group, the salmonids were adversely effected by higher water temperatures[1]. The trend is particularly apparent above the 17.8° C temperature standard. Below the standard the aquatic vertebrate community was dominated by salmonids but above the standard the balance shifted towards non-salmonid species. Moreover, across all the sites, all three salmonids were found in waters that averaged at or below the temperature standard.

The only sculpin to occur in any numbers across a variety of sites was the reticulate sculpin. This species is abundant and widespread throughout the Coastrange and its' occurrence is unremarkable. However, changes in the abundance or composition in the sculpin community could indicate shifts in the instream habitat structure. Unfortunately, fundamental research on the habitat preferences and tolerances is sparse and anecdotal.

Of the remaining fish groups, only Pacific lamprey juveniles and speckled dace occurred at a number of sites. Speckled dace are notable for their tolerance to warmer water and an increase in their numbers could indicate a warming trend in the future (Zaroban et al, 1999). Conversely, the Pacific lamprey is a cold water species that is parasitic on salmonids. An increase in temperature or a decline in salmon numbers could express itself as a decline in lamprey numbers. Suckers and stickleback were poorly represented groups in our surveys but both are indicators of warmer water.

The value of the amphibian data will express itself over time. Tailed frogs and Pacific giant salamanders are good indicators of habitat changes because they are intolerant of warm water and sediment and have been linked to anthropogenic disturbance in several studies (Bury and Corn 1988). Other studies have shown that native frogs are susceptible to elevated levels of nitrates and un-ionized ammonia below EPA standards (Marco 1997). Keeping track of the presence and abundance of amphibians could provide valuable information about trends in non-point source pollution in some areas.

The value of the collecting information on the aquatic vertebrate community will increase over time. As we continue to gather information on the vertebrate community, patterns and trends will become clearer and the information will provide insights that will assist in making the appropriate management decision for different situations.

[1] The North Fork of Mill Creek was not included in the discussion on temperature because it was in an ecoregion that exhibited characteristics typical of location East of the Cascades.

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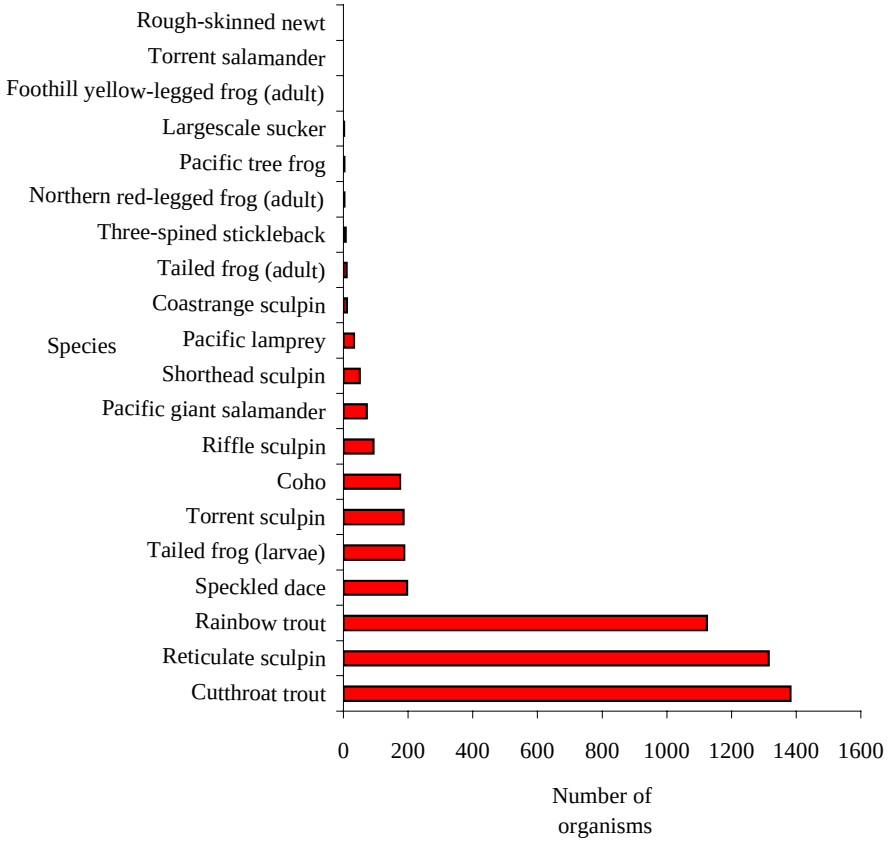

Figure 1. Total Aquatic Vertebrates by Species

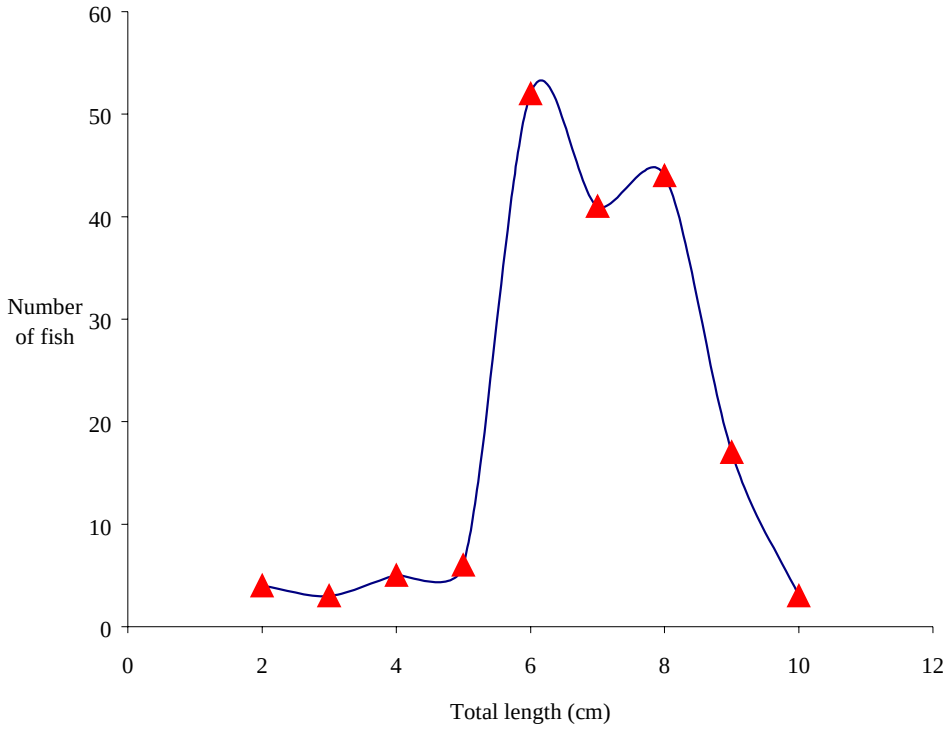

Figure 2. Coho size class distribution

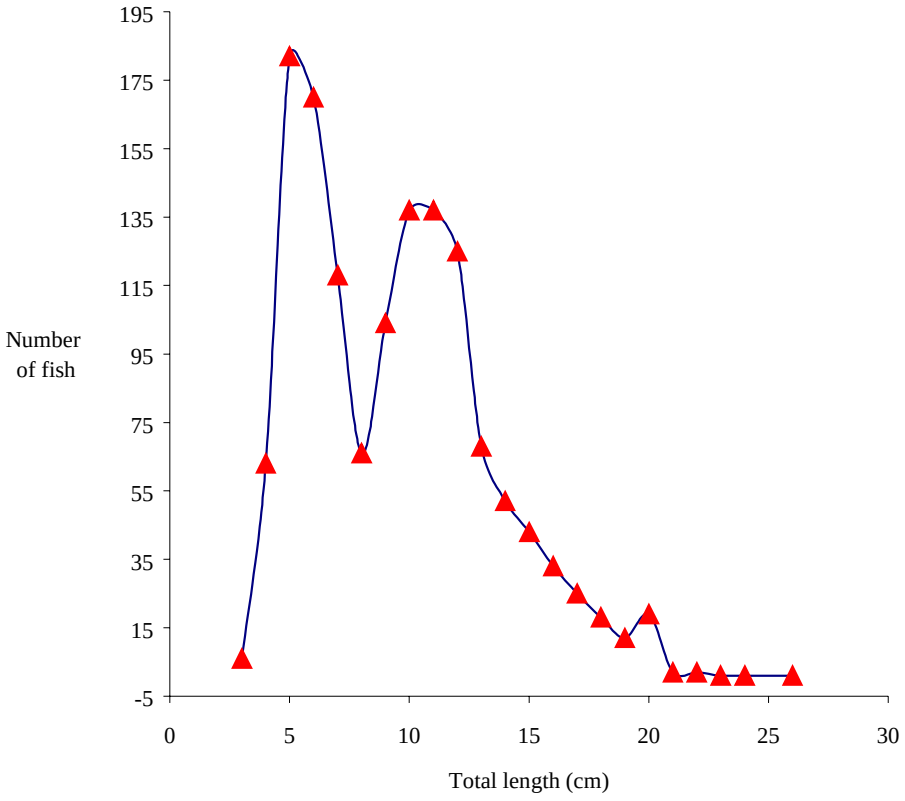

Figure 3. Cutthroat size distribution

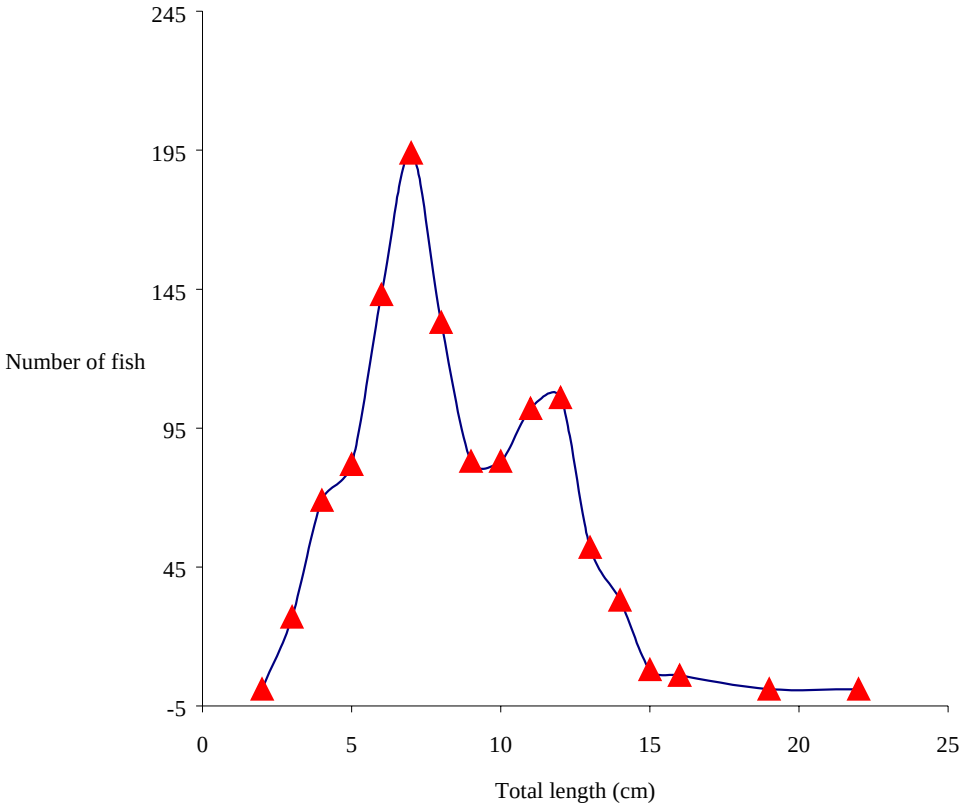

Figure 4. Rainbow size class distributon

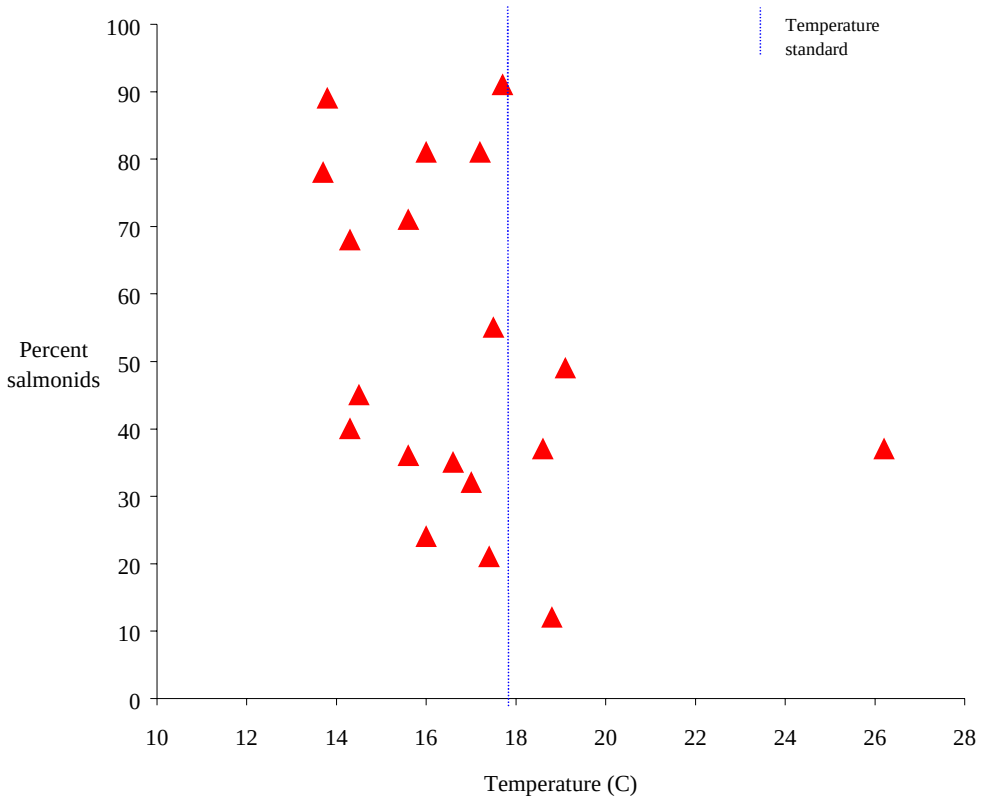

Figure 5. Percentage of salmonids vs maximum 7 day moving average

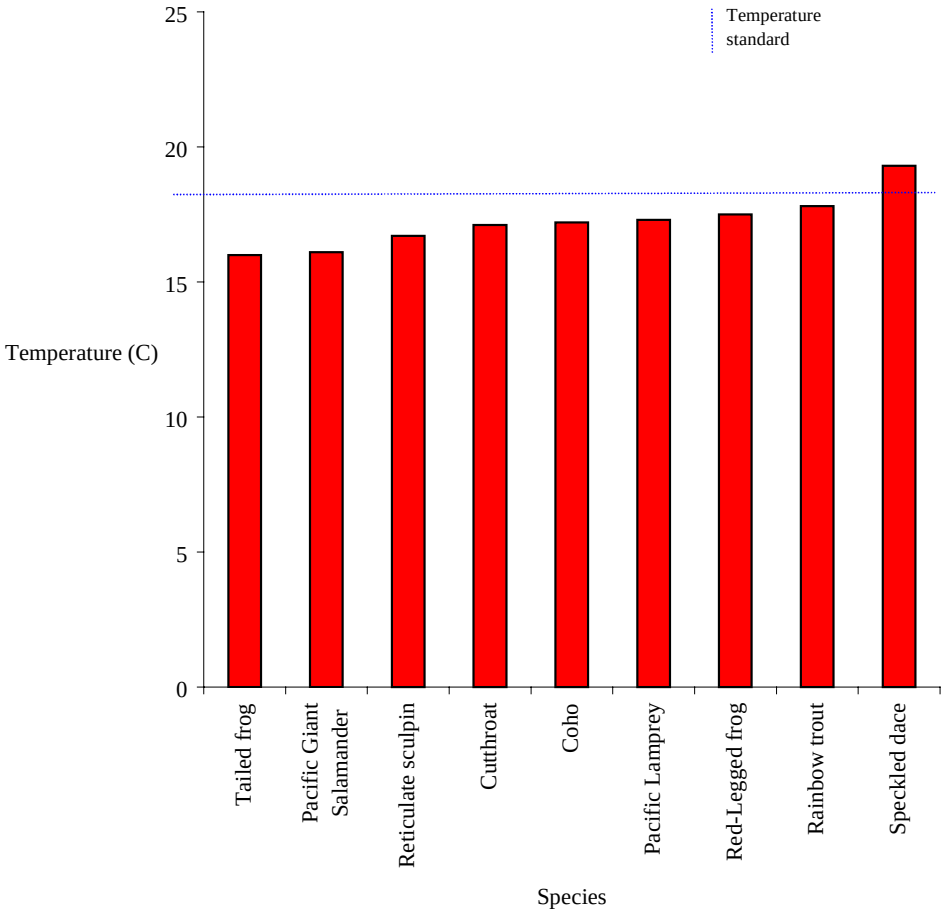

Figure 6. Average water temperature for selected species